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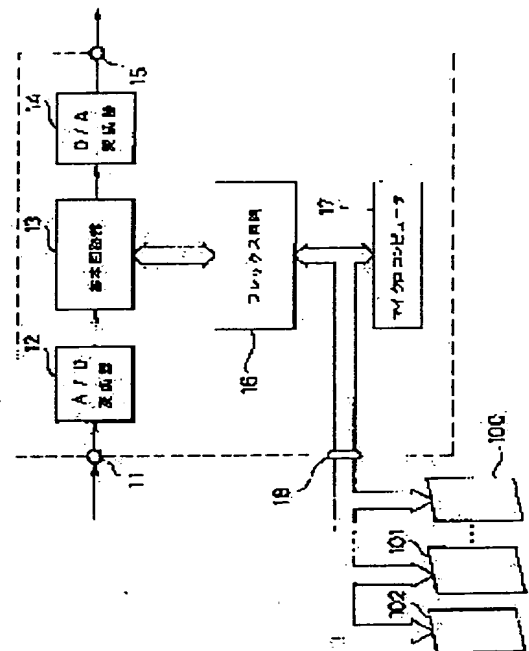
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## (54) FLEXIBLE ELECTRONIC CIRCUIT DEVICE

(57) Abstract:

PURPOSE: To bring a profit to both of a user and a maker at the time of improving the function or changing the signal form by supplying a new program to perform the signal processing in a system, which is different from the system used till then, on the user side having the same fundamental circuit device.

CONSTITUTION: A signal to be processed is subjected to A/D conversion and is inputted to a fundamental circuit part 13, and a flex circuit 16 can be changed to a form different from the signal processing form dependent upon only the fundamental circuit part 13 together with the function block of the fundamental circuit part 13 by the control of a microcomputer 17. That is, the flex circuit 16 can support the part which the function of the fundamental circuit part 13 cannot cover. The signal outputted from the fundamental circuit part 13 is led out to an output terminal 15 through a D/A converter 14.



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PRIOR ART

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[Description of the Prior Art] Now, VTR, a CD player, etc. rush into one set of an one person age, and a digital technique progresses, and all applications are attained. In such status, a demand of an user also desires a high-end model kind, desires the thing with an additional function, or reaches variably. On the other hand, the manufacturer side is also desired by the small quantity multi-form production that it should reply to a demand of an user.

[0003] For example, VTR etc. also has some from which a recording method is different. Moreover, even if it is in a television method, various kinds of methods and the transmission system of an additional signal are developed. On the other hand, the manufacturer is obliged to the design development of VTR corresponding to the all directions form i, and the development design of a television set.

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] As mentioned above, in order for an electronic instrument to cross variably, when there are some their specifications needed, an user needs to arrange the model which doubled and corresponded to it, and may own VTR of several sets and the television receiving set of a high-end model kind from type conventionally. Moreover, in order to arrange the product of many forms with a manufacturer side, it is necessary to perform recombination of a production line, redo of a design, and a development design of a product, and the great burden has started. further -- again -- recently -- the cycle of goods -- short -- the both sides of an user and a manufacturer -- \*\* -- intermediary size -- there is a \*\*\*\* burden

[00C Then, an user only owns the same basic circuit apparatus, and only supplies a new program to this, and this invention aims him at offering the flexible electronic-circuitry equipment which makes possible signal processing of a method completely different from former.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the flexible electronic-circuitry equipment used for various kinds of electronic instruments for public welfare, for example, a TV apparatus, a video tape recorder (it is described as VTR below), etc.

[0002]

[Description of the Prior Art] Now, VTR, a CD player, etc. rush into one set of an one person age, and a digital technique progresses, and all applications are attained. In such status, a demand of an user also desires a high-end model kind, desires the thing with an additional function, or reaches variably. On the other hand, the manufacturer side is also desired by the small quantity multi-form production that it should reply to a demand of an user.

[0003] For example, VTR etc. also has some from which a recording method is different. Moreover, even if it is in a television method, various kinds of methods and the transmission system of an additional signal are developed. On the other hand, the manufacturer is obliged to the design development of VTR corresponding to the all directions formula, and the development design of a television set.

[0004]

[Problem(s) to be Solved by the Invention] As mentioned above, in order for an electronic instrument to cross variably, when there are some their specifications needed, an user needs to arrange the model which doubled and corresponded to it, and may own VTR of several sets and the television receiving set of a high-end model kind from type conventionally. Moreover, in order to arrange the product of many forms with a manufacturer side, it is necessary to perform recombination of a production line, redo of a design, and a development design of a product, and the great burden has started. further -- again -- recently -- the cycle of goods -- short -- the both sides of an user and a manufacturer -- \*\* -- intermediary size -- there is a \*\*\*\* burden

[0005] Then, an user only owns the same basic circuit apparatus, and only supplies a new program to this, and this invention aims him at offering the flexible electronic-circuitry equipment which makes possible signal processing of a mode completely different from former.

[0006]

[Means for Solving the Problem] It connects with the basic circuit which obtains a basic operation, the flexible circuit in which the program operation to which the exchange of a signal was connected possible in both directions to the aforementioned basic circuit is possible, and the aforementioned flexible circuit to an input signal, and this invention is equipped with a connection means by which the aforementioned program can be inputted for the aforementioned flexible circuit from the exterior to a centralized-control circuit controllable by the program, and the aforementioned centralized-control circuit.

[0007]

[Function] By the above-mentioned means, the aforementioned flexible circuit can be supported by the centralized-control circuit, can incorporate the aforementioned basic circuit, can change to the digital disposal circuit according to the program, and becomes possible [ realizing the signal-processing function which is not in a basic circuit ]. By switching and inputting various kinds of programs from the exterior, various kinds of digital disposal circuits in the domain from which a flexible circuit can change are realizable.

[0008]

[Example] Hereafter, the example of this invention is explained with reference to a drawing.

[0009] Drawing 1 is one example of this invention, and shows the basic configuration. Usually, the signal should be processed is supplied to an input terminal 11. An input terminal 11 is inputted into the analog (A/D) converter 12, and is carried out in digital one. The outgoing end of A/D converter 12 is input

circuit section 13. The basic circuit section 13 contains the circuit which obtains some fundamental functions. The signal processed in this basic circuit section 13 is inputted into the digital analog (D/A) converter 14, turns into an analog signal, and is drawn by the output terminal 15.

[0010] The FREX circuit 16 is connected to the basic circuit section 13 possible [ a signal exchange in both directions ] here. The FREX circuit 16 is set as the basis of the function's control of a microcomputer 17 (centralized-control circuit), and various kinds of circuits or gate arrays are usually mounted irrelevant. However, if controlled by the microcomputer 17, it will be built so that a function may be demonstrated on the basis of this control predetermined.

[0011] The block surrounded by the dotted line in drawing is built into the interior of electronic equipment, and the external terminal 18 is formed. The card fields 100, 101, and 102 are alternatively connectable with the external terminal 18. The program for operating a microcomputer 17 is stored in the card field, and the circuit by the hardware which has a predetermined signal-processing function if needed is incorporated.

[0012] According to the above-mentioned system, the digital-disposal-circuit pattern by the FREX circuit 16 can be built by inputting from the exterior the program which controls a microcomputer 17. Moreover, you may be the type where the circuit of the part constructed to the basic circuit section 13 interior in this case was incorporated.

[0013] Therefore, the FREX circuit 16 and the basic circuit 13 can perform signal processing in adaptation according to various kinds of signals. Moreover, in addition to signal processing performed only in the basic circuit section 13, a functional rise can be obtained by adding the function of the FREX circuit 16.

[0014] Drawing 2 is an example to which this invention was applied, and is the example which aimed at the functional rise in the recording system circuit of VTR. The basic circuit section 13 has brightness and the chrominance-signal (Y/C) separation circuit 21, the Y-signal processing section 22 to which the luminance signal separated here is supplied, and C signal-processing section 23 to which the separated chrominance signal is supplied. Moreover, it has the multiplexer 24 which carries out the multiplexing of the digital signal drawn from the Y-signal processing section 22 and C signal-processing section 23. The output of a multiplexer 24 is inputted into D/A converter 14.

[0015] Here, the FREX circuit 16 includes switches SW1, SW2, and SW3. A switch SW1 can supply the output of A/D converter 12 to Y / C separation circuit 21 or the subtractor 31, a coefficient multiplication, and the 1st input edge of an adder 32. The output of the coefficient adder 32 is inputted into a subtractor 31. Moreover, it can dissociate from the signal from an adder 31, or the Y / C separation circuit 21, and a switch SW2 can choose either of the Y signals, and can input it into the Y-signal processing section 22. A switch SW3 can introduce into C signal-processing section 23 either of the C signals separated in the coefficient multiplication and the chrominance signal from an adder 32, or the Y / C separation circuit 21.

[0016] The aforementioned switches SW1-SW3 etc. are controlled by the switch signal generation section 33 controlled by the program. This example is an example switched to Y / C separation circuit which used the frame correlation for this functional rise, although the basic circuit 13 formed Y / C separation circuit 21 by the radial fin type filter which used line correlation before. This example is an example which was not preparing the field memory for the interior of the FREX circuit 16 by chance. Although two field memories are required as a retardation means in order to use a frame correlation, the external card field 100 is equipped with the hardware which the basic circuit runs short of in this example. That is, the output of a switch SW1 is inputted also into the field delay circuit 44 prepared in the external card field 100 while it is inputted into a coefficient multiplication and the adder 32. The field delay circuit 45 is also formed in the external card field 100 in series with the field delay circuit 44. The output of the field delay circuit 44 and the output of the field delay circuit 45 are inputted into the coefficient multiplication and the adder 32.

[0017] When the FREX circuit 16 is switched as mentioned above, 3-dimensional Y / C isolation can be realized. That is, by the field delay circuit prepared in the card field, the hardware running short can be supported and a functional rise can be aimed at in the FREX circuit 16.

[0018] As gestalt of the basic circuit section 13 and the FREX circuit 16, various kinds of examples are possible. For example, the digital disposal circuit of a television relation is prepared in the interior of the basic circuit section 13, many an adder, subtractors, inverters, multipliers, etc. are formed in the FREX circuit 16 interior, and these are set up so that it may be switched to various kinds of connection patterns by the switch group. If it does in this way, it will also become possible to carry out various manipulation processings of the internal digital video signal, and to compound the picture signal from the external card field to an internal picture signal according to a program, of the rest. As a digital disposal circuit prepared in the interior of the basic circuit section 13, you may be the record in VTR, and a regenerative-signal processing circuit.

[0019] In addition, in the above-mentioned example, although the external terminal 18 explained that the external card field 100 was also 1 by one when loading with the external card field 100, the number of the external card fields linked to the number of the external terminals 18 or this is not limited to this, either. Moreover, although it explained that a microcomputer was built in as external card field, it may be accessed by rule of the microcomputer 17 already carried in the product even if it does not build especially. Moreover, as for the internal configuration of the FREX circuit 16, it is even good that there are only gate and a unit delay.

[0020]

[Effect of the Invention] As explained above, according to this invention, the user is advantageous to the both sides of an user and a manufacturer, when only own the same basic circuit apparatus, a new program is only supplied to this, it is enabled to perform signal processing by the method different from former and a functional rise and a signal format are changed.

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CLAIMS

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[Claim(s)]

[Claim 1] The flexible electronic-circuitry equipment characterized by to be connected with the basic circuit which obtains a basic operation, the flexible circuit in which the program operation to which the exchange of a signal was connected possible in both directions to the aforementioned basic circuit is possible, and the aforementioned flexible circuit to an input signal, and to provide a connection means to by\_ which the aforementioned program can be inputted, from the exterior for the aforementioned flexible circuit to a centralized-control circuit controllable by the program, and the aforementioned centralized-control circuit.

[Claim 2] The aforementioned connection means is flexible electronic-circuitry equipment according to claim 1 characterized by being the card field which carries the integrated circuit in which a central control unit and memory were built.

[Claim 3] Flexible electronic-circuitry equipment according to claim 2 characterized by carrying the signal processor of the aforementioned fixed function in order to compensate the aforementioned card field with the operation of the aforementioned flexible circuit other than the aforementioned central control unit and memory.

[Claim 4] Flexible electronic-circuitry equipment according to claim 1 characterized by containing functional block which processes the signal of the format specified beforehand in the aforementioned basic circuit, and containing the switch group in which adjustable is possible by the control data from the aforementioned centralized-control circuit in these circuit connection patterns while a unit logic, a selector, an inverter, and a unit-delay machine are included in the aforementioned flexible circuit at least.

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